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Weapon Injury Update

A Publication of the Weapon-Related Injury Surveillance System

University of Massachusetts
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October 1999

Weapon-Related Injuries Continue Downward Trends

Weapon-related injuries declined for the fourth year in a row according to reports filed with the Massachusetts Department of Public Health's (MDPH) Weapon-Related Injury Surveillance System (WRISS). The overall number has dropped every year from 1994 through 1997, the last year for which statewide data are available. In 1997, hospitals reported 1,947 weapon-related injuries compared to 2,272 in 1996, a 14% decline attributable to a reduction in violence-related injuries. Table 1 provides an overview of yearly totals by injury intent and weapon type for all injuries reported to WRISS.

While violence-related weapon injuries declined significantly over the four year period, accidental gunshot wounds remained stable (Table 1). To obtain additional information on accidental gunshot wounds, WRISS conducted a follow-up survey on patients treated for such injuries. More than half of all accidental gunshot wounds resulted from nonpowder guns (e.g., BB/pellet guns). These guns are often considered toys, but can inflict serious injury and even death. An overview of survey findings related to nonpowder gun injuries can be found on page 2. The total number of accidental gunshot wounds for Massachusetts cities and towns for the years 1994-1997 are reported on the insert.

Violence-Related Injuries

The downward trend among violent shooting and stabbing injuries continued in 1997. Violence-related gunshot wounds declined by 20% from 1996 and sharp instrument wounds declined by 13%. Figure 1 illustrates the overall numbers among Massachusetts residents by type of wound since 1994, showing a 28% reduction in violence-related sharp instrument wounds and a 53% reduction among violent gunshot wounds, over the four year period.

Other large declines occurred in 1997. Among Boston residents, a 25% decline among all violence-related injuries and a 34% decline specifically among violent gunshot wounds was noted—a decline comparable to the 27% reduction in homicides reported by Boston Police for 1997.[1] Additionally, 23% fewer cases were reported among communities with populations of 25,000 to 50,000.

Shown in Figure 2 are the 15 cities with the highest weapon injury rates for 1997 among cities with populations of more than 25,000. 1996 rates are provided for comparative purposes and reveal that while many cities show declines for the year, a number of cities show increases. See page 3 for the actual number of violence-related injuries reported in 1996 and 1997 by city and town.

There was more variation from 1996 to 1997 when measuring differences by gender, age group and race/ethnicity. Among black males, violent weapon injuries continued to drop sharply (45%) in the 15-19 age category. A 33% decline also occurred in the 45-64 age group but an increase of 14% was noted for persons ages 25-34. Declines were

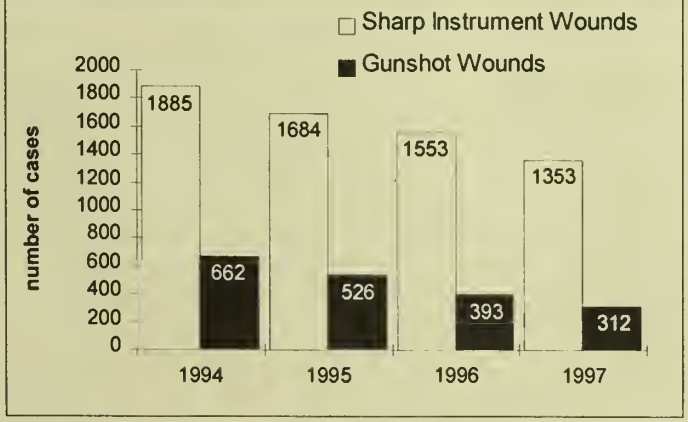
(continued on page 4)

Table 1. Patients Treated by Massachusetts Emergency Departments for Gunshot Wounds (GSWs) and Sharp Instrument Wounds (SIWs)

	1994 Cases	1995 Cases	1996 Cases	1997 Cases	1997 Rate
Massachusetts Residents:					
Violence-related SIWs	1885	1684	1553	1353	22.0
Violence-related GSWs	662	526	393	312	5.1
Total Violent Cases	*2547*	*2210*	*1946*	*1665*	*27.1*
Accidental GSW	163	155	166	158	2.6
Self-Inflicted GSW	47	47	35	26	.4
Unspecified GSW	108	100	72	48	.8
Total Other Cases	*318*	*302*	*273*	*232*	*3.8*
Total Mass. Cases	2865	2512	2219	1897	30.9
Out-of-State Residents	63	53	53	50	--
Total Injuries Reported	2928	2565	2272	1947	--

NOTES: Rates are per 100,000 population based on 1995 population data estimates developed by the Massachusetts Institute for Social and Economic Research. Based on reviews from 1994-1996, hospitals report approximately 75% of reportable cases. Fatalities not transported to emergency departments (EDs) are not reported here. Most self-inflicted GSWs result in death and are not taken to the ED.

Figure 1. Number of Violence-Related Gunshot and Sharp Instrument Wounds, Massachusetts Residents, 1994-1997



[1] City of Boston. *1997 Crime Summary Report.* July 1998.

Emergency Department Personnel

Thank You

In 1990, the Weapon-Related Injury Surveillance System (WRISS) began tracking gunshot and stabbing incidents among Massachusetts residents.

Initally limited to three emergency departments, the system quickly expanded and by November 1993 all 85 acute care hospital emergency departments were reporting cases. The first ED-based weapon injury surveillance system in the nation, WRISS marked its five year anniversary of statewide reporting in 1998.

The data provided by hospital EDs has proved valuable to hundreds of injury prevention professionals throughout the Commonwealth. Because WRISS can provide data at the local level, grassroots organizations often use it for prevention planning. Data are also provided to researchers, the media, and national organizations, as well as cities and states looking to replicate the system within their regions. We have had requests from state and national leaders including Senator Ted Kennedy, Governor William Weld, and the Office of the White House.

To all the hospital ED personnel who track down the information, complete the forms and coordinate the collection systems in-house, we thank you.

Accidental Gunshot Survey Results

A confidential follow-up questionnaire, the Accidental Gunshot Survey (AGS), was sent to patients who were reported to WRISS as having an accidental gunshot wound. The purpose of the AGS was to capture additional information on how the injury occurred, gun ownership and shooter characteristics, and severity of the injury, and to explore gun-related issues such as storage patterns and where and why the gun was purchased.

Hospitals forwarded the survey to 132 patients. Sixty surveys were returned for a response rate of 45%. Among the surveys returned, nonpowder guns such as BB or pellet guns accounted for the majority of injuries, 68% (n=41) compared to 32% (n=19) for firearm-related injuries.

There were slight variations for certain variables, such as age and type of weapon used (nonpowder vs. firearm), for survey respondents compared to all accidental gunshot wounds reported to WRISS during the same time period. Differences were not statistically significant.

The findings summarized here are based on survey responses of persons accidentally shot with a nonpowder gun.

Nonpowder Gunshot Accidents

Nonpowder guns use compressed air, gas or a mechanical spring action rather than gun powder to propel ammunition. These guns are generally accepted as relatively harmless toys but can inflict serious pain and injury, and in rare cases even death. Nonpowder guns *are* real guns. Moreover, modern technology has contributed to the development of more powerful nonpowder guns capable of shooting projectiles at velocities comparable to many pistols.[1]

Among survey respondents, most of the victims were male (85%), white (88%), and 12-18 years old (66%).

In 22% of the cases, both the patient and shooter were under the age of 15. While we cannot identify from the AGS whether an adult was present, it may be worth noting that Massachusetts state law specifies that nonpowder guns may not be sold to a minor (under the age of 18), and a minor under the age of 15 may not fire such a gun unless accompanied by an adult.

How Did the Injury Happen?

More than a quarter of injuries (27%) occurred because gun handlers thought the gun was unloaded, and nearly a quarter (24%) occurred when patients were shot by someone else aiming at another target (including injuries caused by ricochets). An additional 20% of injuries occurred while loading and unloading the gun including trying to put the safety on and thinking the safety was engaged.

Who Did the Shooting, Who Owns the Gun?

More than a third of the guns, 36%, were owned by the patients themselves and 46% were owned by a friend, neighbor, or acquaintance.

Patients accidentally shot themselves in 40% of the cases, while 45% were accidentally shot by a friend, neighbor, or acquaintance.

In 20% of the cases, the patient was both gun owner and shooter. Among cases in which a friend, neighbor, or acquaintance owned the gun, the shooter was most likely to be a friend, neighbor, or acquaintance (79%). The AGS did not clarify whether the friend, neighbor, or acquaintance who did the shooting was the same friend, neighbor, or acquaintance who owned the gun.

Where Was the Gun Purchased and Why?

Almost half of the guns (49%) were bought from a sports or department store, while only about 3% were bought at a gun shop. The most common reason given for buying or obtaining the gun was for recreational purposes (59%).

Severity of Injury

Although nearly 93% of the patients were treated and released from the hospital, 63% of patients reported limited ADL (activities of daily living) and almost 44% of patients reported missing either school or work in the two months following their injuries.

An Ounce of Prevention

Effective prevention strategies to reduce accidental nonpowder gunshot injuries should encompass the three *'E's* of injury control: engineering, enforcement, and education. The following incorporate recommendations from the American Academy of Pediatrics.[2]

Engineering:

-Manufacturers should adopt design modifications that include: preventing the use of substitute projectiles or live ammunition, adding a load status indicator, modifying the safety to further reduce unintentional discharge, and decreasing impact velocities to below that which could penetrate skin or cause ocular injuries.

Enforcement:

-Apply existing laws related to the purchase and supervision of nonpowder guns.

-Apply existing firearm regulations to high powered nonpowder guns which can attain impact velocities of 275 feet per second up to 900 ft/s. These guns can penetrate not only skin but bone as well.

Education:

-Pediatricians should counsel parents concerning the hazards of having nonpowder guns in the home.

-Safety rules and the manufacturers instruction manual should be reviewed before engaging in target shooting. (Almost half the respondents' injuries occurred while target shooting.)

-Shooters should be aware of their surroundings at all times to ensure bystanders are at a safe distance.

-Targets that can cause ricochets, such as hard or flat objects and rubber objects like tires, should never be used. Anyone handling or shooting the gun should consult the instruction manual for information about the use of safe targets.

-Eye protection should be used to prevent ocular injuries.

-Gun handlers should be especially mindful while loading and unloading the gun.

-Gun handlers should *always* assume that the gun is loaded even when the gun is *known* to be unloaded. This is especially critical since nonpowder guns do not have load indicators and many injuries result from the mistaken assumption that the gun is not loaded.

[1] Harris, W, Luterman, A, and Curreri, W. BB and pellet guns-toys or deadly weapons? *J. Trauma*, 23:568, 1983.

[2] American Academy of Pediatrics. Injuries related to "toy" firearms (RE7085). Policy Statement, 79:3, 1987.

Accidental Gunshot Wounds to Massachusetts Residents, 1994-1997

Cases Reported by Massachusetts Hospital Emergency Departments to Massachusetts Department of Public Health

Patient's Town	Firearms	Nonpowder Guns	Total
Acton	1	0	1
Acushnet	2	1	3
Adams	1	1	2
Amesbury	0	1	1
Andover	3	2	5
Arlington	2	0	2
Ashburnam	0	1	1
Ashby	0	1	1
Ashfield	2	0	2
Athol	1	6	7
Attleboro	0	3	3
Auburn	1	1	2
Avon	0	1	1
Ayer	0	1	1
Barnstable	0	5	5
Barre	1	2	3
Bedford	1	0	1
Belchertown	0	1	1
Bellingham	1	2	3
Belmont	2	0	2
Berkley	1	2	3
Berlin	0	1	1
Beverly	0	3	3
Billerica	0	4	4
Blackstone	1	0	1
Boston	24	16	40
Bourne	0	2	2
Boylston	0	1	1
Brimfield	0	1	1
Brockton	3	5	8
Brookfield	0	2	2
Cambridge	4	1	5
Canton	1	0	1
Carver	0	1	1
Charlemont	1	1	2
Chelmsford	1	1	2
Chelsea	1	2	3
Cheshire	0	2	2
Chicopee	2	3	5
Chilmark	0	1	1
Clarksburg	0	1	1
Clinton	0	1	1
Cohasset	0	2	2
Colrain	1	0	1
Danvers	2	0	2
Dartmouth	1	1	2
Dedham	1	1	2
Deerfield	1	0	1
Dennis	1	2	3
Dighton	1	0	1
Douglas	1	0	1
Dover	0	1	1
Dracut	0	1	1
Dudley	2	2	4
E Bridgewater	2	2	4
Eastham	1	0	1
Easton	1	0	1
Everett	3	3	6
Fairhaven	0	1	1
Fall River	3	10	13
Falmouth	2	0	2
Fitchburg	2	2	4
Florida	0	1	1
Foxborough	1	1	2
Framingham	1	5	6
Franklin	2	1	3
Freetown	0	1	1
Gardner	1	3	4
Georgetown	2	0	2
Gill	0	1	1
Gloucester	1	4	5
Grafton	1	0	1
Granby	1	0	1
Greenfield	2	2	4
Groton	0	1	1
Hadley	1	0	1
Halifax	1	1	2
Hampden	0	1	1
Haverhill	2	12	14
Holbrook	0	1	1
Holliston	0	3	3
Holyoke	0	3	3
Hopedale	0	1	1
Hubbardston	0	2	2
Hudson	1	2	3
Hull	0	1	1
Huntington	2	0	2
Ipswich	1	1	2
Kingston	1	2	3
Lakeville	0	1	1
Lancaster	0	1	1
Lanesborough	0	2	2
Lawrence	18	8	26
Leicester	1	2	3
Lenox	1	0	1
Leominster	0	2	2
Lexington	0	1	1
Lincoln	1	0	1
Longmeadow	0	1	1
Lowell	6	9	15
Ludlow	1	2	3
Lynn	6	5	11
Lynnfield	1	1	2
Malden	2	2	4
Mansfield	0	3	3
Marblehead	2	0	2
Marlborough	0	3	3
Marshfield	0	4	4
Maynard	0	2	2
Medfield	1	0	1
Medford	1	2	3
Melrose	1	2	3
Merrimac	0	1	1
Methuen	1	3	4
Middleborough	1	1	2
Middleton	0	4	4
Milford	1	2	3
Millbury	2	1	3
Milton	2	1	3
Monroe	0	1	1
Monson	0	2	2
Montague	1	0	1
Nantucket	0	2	2
Natick	2	0	2
Needham	0	1	1
New Bedford	5	6	11
New Braintree	0	1	1
Newburyport	1	2	3
Newton	0	2	2
North Adams	2	1	3
North Andover	2	0	2
North Attleboro	0	3	3
North Brookfield	0	2	2
North Reading	2	0	2
Northampton	1	0	1
Northborough	0	2	2
Northbridge	0	1	1
Northfield	1	0	1
Norton	2	0	2
Norwood	0	1	1
Orange	2	4	6
Oxford	1	0	1
Palmer	0	3	3
Peabody	2	2	4
Pembroke	1	1	2
Pepperell	0	1	1
Peru	0	1	1
Petersham	0	1	1
Phillpston	0	1	1
Pittsfield	0	1	1
Plymouth	1	8	9
Plympton	0	1	1
Quincy	6	2	8
Randolph	0	1	1
Rayhnam	0	1	1
Reading	0	1	1
Rehoboth	1	0	1
Revere	1	5	6
Richmond	0	1	1
Rockland	1	1	2
Rockport	0	1	1
Rowe	0	1	1
Russell	1	1	2
Salem	1	2	3
Salisbury	1	1	2
Sandwich	0	1	1
Saugus	4	1	5
Seekonk	0	1	1
Sheffield	0	2	2
Shrewsbury	4	2	6
Somerville	1	0	1
South Hadley	0	1	1
Southbridge	2	2	4
Southwick	0	1	1
Spencer	0	2	2
Springfield	17	14	31
Stockbridge	0	2	2
Stoneham	1	1	2
Sturbridge	0	1	1
Sutton	1	0	1
Swansea	1	1	2
Taunton	3	6	9
Templeton	0	1	1
Tewksbury	1	2	3
Truro	1	0	1
Tyngsborough	2	0	2
Uxbridge	0	2	2
Wakefield	1	0	1
Waltham	2	1	3
Ware	1	4	5
Wareham	2	1	3
Washington	1	0	1
Watertown	0	3	3
Webster	2	1	3
Wellesley	1	0	1
West Boylston	0	1	1
West Bridgewater	0	1	1
West Springfield	1	0	1
West Tisbury	0	1	1
Westborough	1	0	1
Westfield	3	4	7
Weston	1	1	2
Westport	0	2	2
Weymouth	3	2	5
Whately	0	1	1
Wilbraham	1	0	1
Wilmington	1	3	4
Winchendon	1	4	5
Winchester	0	1	1
Winthrop	2	0	2
Woburn	2	1	3
Worcester	5	7	12
Yarmouth	0	1	1
Massachusetts*	**260**	**382**	**642**

*Statewide total includes 4 cases for which resident town was missing or unknown.

Source: Weapon-Related Injury Surveillance System, MDPH. *Weapon Injury Update*. Insert. October 1999.

Violence-Related Gunshot Wounds and Sharp Instrument Wounds

1996 and 1997 Cases Reported by Massachusetts Hospital Emergency Departments to Massachusetts Department of Public Health

Patient's City/Town	'95 Population	1996 Cases	1997 Cases	'97 Rate/ 100,000 Pop.	Patient's City/Town	'95 Population	1996 Cases	1997 Cases	'97 Rate/ 100,000 Pop.
Group 1: Cities/Towns over 175,000 population:									
Boston	582,491	586	440	75.5	*Group 1 Total*	*582,491*	*586*	*440*	*75.5*
Group 2: Cities/Towns 75,000-175,000 population:									
Brockton	91,325	99	91	99.6	Newton	82,837	3	2	2.4
Cambridge	99,772	23	16	16.0	Quincy	84,201	23	14	16.6
Fall River	92,560	48	55	59.4	Somerville	79,415	34	22	27.7
Lowell	107,531	36	44	40.9	Springfield	155,778	133	106	68.0
Lynn	81,932	50	48	58.6	Worcester	171,226	101	104	60.7
New Bedford	99,088	55	45	45.4	*Group 2 Total*	*1,145,665*	*605*	*547*	*47.7*
Group 3: Cities/Towns 50,000-75,000 population:									
Brookline	59,464	3	3	5.0	Malden	54,244	24	18	33.2
Chicopee	56,769	9	17	29.9	Medford	57,782	13	15	26.0
Framingham	64,573	10	8	12.4	Taunton	52,259	20	13	24.9
Haverhill	55,806	28	13	23.3	Waltham	60,576	8	12	19.8
Lawrence	69,712	77	81	116.2	Weymouth	53,721	11	5	9.3
					Group 3 Total	*584,906*	*183*	*185*	*31.6*
Group 4: Cities/Towns 25,000-50,000 population:									
Agawam	28,009	0	2	7.1	Melrose	26,607	3	3	11.3
Amherst	35,987	2	2	5.6	Methuen	39,994	14	5	12.5
Andover	27,659	0	1	3.6	Natick	30,083	1	1	3.3
Arlington	42,736	0	0	0.0	Needham	27,398	0	0	0.0
Attleboro	40,183	7	9	22.4	North Attleboro	25,888	5	2	7.7
Barnstable	43,604	8	2	4.6	Northampton	30,840	1	3	9.7
Beverly	37,686	6	6	15.9	Norwood	27,643	2	2	7.2
Billerica	36,071	4	4	11.1	Peabody	47,371	4	2	4.2
Braintree	31,961	7	3	9.4	Pittsfield	46,657	18	19	40.7
Bridgewater	25,367	2	3	11.8	Plymouth	48,891	5	4	8.2
Chelmsford	33,013	5	1	3.0	Randolph	30,758	5	6	19.5
Chelsea	31,434	30	33	105.0	Revere	37,005	20	20	54.0
Dartmouth	28,118	5	1	3.6	Salem	40,843	7	13	31.8
Dracut	28,351	0	1	3.5	Shrewsbury	26,718	2	3	11.2
Everett	36,539	28	8	21.9	Stoughton	27,561	1	2	7.3
Falmouth	29,600	0	2	6.8	Tewksbury	29,159	0	2	6.9
Fitchburg	40,800	15	16	39.2	Watertown	33,826	3	3	8.9
Gloucester	28,429	2	2	7.0	Wellesley	27,065	1	0	0.0
Holyoke	42,227	37	34	80.5	West Springfield	28,111	2	2	7.1
Leominster	41,786	7	4	9.6	Westfield	40,193	5	3	7.5
Lexington	29,758	2	0	0.0	Woburn	35,560	8	4	11.2
Marlborough	32,728	4	3	9.2	*Group 4 Total*	*1,460,217*	*305*	*236*	*16.2*
Group 5: Cities/Towns under 25,000 population:					*Group 5 Total*	*2,364,423*	*184*	*199*	*8.4*
Massachusetts.....*Total*						*6,137,702*	*1,946*	*1,665*	*27.1*

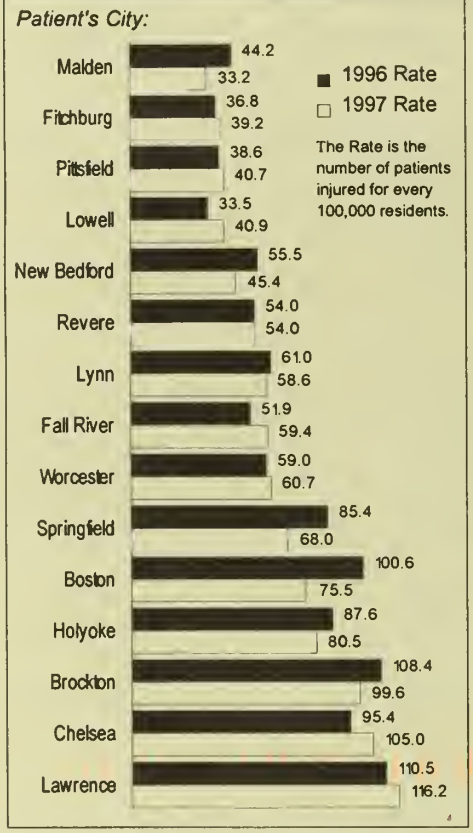
NOTES: Cases are reported by hospitals and are not adjusted for underreporting. Based on record reviews conducted between 1994 and 1996, hospitals report approximately 75% of reportable cases. Pre-hospital deaths are not included in the reporting system. Rates are based on 1995 population data estimates developed by the Massachusetts Institute for Social and Economic Research. Prior calculations utilized the 1990 US Census Modified Age Race Sex File. Towns under 25,000 population are not separately listed because low case incidence and small population result in unstable rates. The Massachusetts total includes homeless cases and cases with unknown city (13 homeless and 45 unknown in 1997).

Downward Trends Continue

(continued from page 1)

also noted among white males, including a 37% decline in the 25-34 age group and a 33% decline in the 45-64 age group. Overall numbers increased slightly among Hispanic males with a 20% increase noted among persons ages 25-34 and a 15% increase among persons ages 35-44.

Figure 2. Violence-Related Weapon Injury Rates Among Large Cities and Towns in 1997



Type of Gun Used?

In order to capture more specificity on the type of gun used, WRISS expanded the weapon category in 1995. Prior to that time, the type of gun was not collected. Table 2 provides the total numbers for type of gun by intent of the injury.

Firearms include handguns, long guns, and unspecified guns. The 'other gun' category may contain firearms as well as unusual gun types such as nailguns. Unspecified guns are believed to be primarily made up of handguns since long guns (shotguns and rifles) and nonpowder gunshot wounds tend to be more easily identifiable and presumably reported by hospital personnel.

Resource Spotlight:

Springfield

Since 1992, Springfield's City-Wide Violence Prevention Task Force has pushed forward an agenda to reduce injuries among its residents. Currently, the task force is involved in many efforts, including a trigger lock giveaway program. For more information about the task force, contact Amy Pasini, Injury Prevention Coordinator at Baystate Medical Center (413-784-4753) or Tony Pettaway, City of Springfield's Violence Prevention Coordinator at 413-787-6710.

You can visit their website at www.increasethepeace.org.

Table 2. Gunshot Wounds, Type of Gun Used by Intent of Injury

Massachusetts Residents, All Ages: 1997

	Violence	Accidental	Self-Inflicted	Total*
Handgun	155	23	11	195
Long Gun	9	18	4	31
Nonpowder Gun	25	96	3	140
Other Gun	18	6	1	27
Unspecified Gun	105	15	7	151
Total	*312*	*158*	*26*	*544*

Massachusetts Residents, All Ages: 1994-1997

	Violence	Accidental	Self-Inflicted	Total*
Handgun	521	102	57	716
Long Gun	45	58	24	134
Nonpowder Gun	125	382	12	610
Other Gun	39	15	2	60
Unspecified Gun	1163	85	60	1498
Total	*1893*	*642*	*155*	*3018*

Massachusetts Residents, Children (ages 17 and under): 1994-1997

	Violence	Accidental	Self-Inflicted	Total*
Handgun	76	14	3	99
Long Gun	12	15	1	29
Nonpowder Gun	63	251	3	372
Other Gun	4	0	0	6
Unspecified Gun	165	18	4	216
Total	*320*	*298*	*11*	*722*

NOTES: The data include patients who are admitted, discharged, or patients who died in the ED. Fatalities not transported to a hospital ED are not captured by WRISS

*This column includes cases for which the intent of the injury was not specified.

Contributions Wanted:

WRISS is planning an expanded five year anniversary newsletter and is interested in highlighting local weapon injury prevention efforts. We are particularly interested in hearing from those who have utilized WRISS data. Please send relevant information about papers, articles, ideas, local task forces and collaborations, interventions, etc. to the Mass. Dept. of Public Health, WRISS: 250 Washington St., 6th Fl., Boston, MA 02108 or fax the information to us at: 617-624-5695.

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Additional support provided by the
Bureau of Family and Community Health

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